

PROCEEDINGS
OF THE
ACADEMY OF NATURAL SCIENCES
OF
PHILADELPHIA.

1886.

JANUARY 5, 1886.

The President, Dr. LEIDY, in the chair.

Twenty-six persons present.

The death of J. B. Lippincott, a member, was announced.

JANUARY 12.

Mr. CHARLES MORRIS in the chair.

Fifteen persons present.

A paper, entitled "New Species of *Partula* from the New Hebrides and Solomon Islands," by Wm. D. Hartman, M. D., was presented for publication.

On the Morphology of superimposed Stamens.—At the meeting of the Botanical Section on January 11, Mr. THOMAS MEEHAN remarked that Sachs teaches that stamens "must be considered morphologically as foliar structures, and make it convenient to term them Staminal Leaves,"¹ and Dr. Asa Gray defines a stamen to be "one of the elements or phylla of the andrœcium."² So far

¹ Text Book, English ed., p. 473.

² Structural Botany, p. 435.

as the speaker knew, no botanist regards the stamen as an axial development, yet there are occasional phenomena that seem to be inexplicable on any other hypothesis. We have to admit that a flower is not merely composed of modified leaves, but is a modified branch;—the branch, arrested in its development, produces sepals and petals in the order and in the place where leaves might have been. Occasionally, however, the usual order of phyllotaxis seems broken. Stamens will spring from the base of petals, and opposite, where we looked for them to alternate; and then for the sake of consistency with the phyllal hypothesis, we have to assume that one theoretic whorl has proved abortive, or that there has been a multiplication of whorls, the superimposed one being the extra. This introduction of an extra series, immediately over the lower, not provided for in the original phyllotaxy, has, I think, never been seen in the normal condition of the branch, and it is difficult to conceive how this could occur under the arrestation of axial growth that transforms the branch into a flower. On the other hand, if we take the petal to be the analogue of the leaf on the elongated branch, there seems no reason why there should not be, theoretically, an axial bud to the petal; and, should this bud develop, it would be the superimposed stamen. Branching and articulated stamens are frequent in those families that have these organs spring, as it were, from an axial bud at the base of the petal, as in a diminutive or suppressed secondary branch we might expect them to do.

The flowers of *Mahernia verticillata* Cav., a well-known Byttneriaceous plant from the Cape of Good Hope, common in cultivation, which he exhibited this evening, seem to indicate that its superimposed stamens are really arrested branches. The genus is separated from *Hermannia* chiefly by a cup-shaped gland at the middle of the stamen (see Fig. 2). A comparison with the

axial development of the inflorescence shows the stamen to be formed on precisely the same plan as the biflowered peduncle (Fig. 1). Really the flowers are axillary—a single flower being produced from the axil of each leaf. What appears to be the “two-flowered peduncle” of authors is simply a diminutive branchlet. After forming one node the longitudinal development becomes nearly arrested, and we have only a shortly-pedicillate and slowly developing flower, representing the shorter of the two in the cut. The bud in the axil of the bracteolate



Mahernia verticillata Cavanilles.

1.—Two-flowered branchlet.

2.—Stamen, magnified.

leaflet, however, makes another and stronger attempt at growth, and pushes up and over the one which terminates the first growth.

In the development of the stamen we read in the same language. The lower leaf from which the short though main peduncle in the inflorescence appears, is typified by the petal. The common peduncle is represented by the filament, and the cup-like gland at the middle stands for the bracteole of the bipedicals. Here one of the flower buds—probably the outermost and weakest in the normal development—wholly disappears, the innermost becomes the upper part of the filament, the next node may be at the connective, and then the theoretical floral leaves proceed to form the anther. The incised bract is reduced to the fringed cup-like gland from which the stamen proper springs.

A close examination of the stamen gives some further facts in support of this theoretical view. When a branchlet is produced from a branch, it is necessarily more slender than the parent branch. The upper half of the *Mahernia* filament is more slender than the part beneath the gland, and, while the lower portion is smooth and membranous, the upper is minutely hispid—variations which we might only expect in distinct internodes. Only for its actual office in supporting and appearing in the direct line of the stamen, we might critically call the lower portion a peduncle, and the portion above the gland the stamen proper.

And we may conclude, after a whole study of the subject, that in many cases superimposed stamens are the development of theoretical axial buds at the base of the petals, and not the result of an interjection of an extra whorl of leaves for which there would be no warrant in phyllotaxy.

JANUARY 19.

The President, DR. LEIDY, in the chair.

Fourteen persons present.

Mastodon and Llama from Florida.—Prof. LEIDY directed attention to some fossil bones, being part of a collection now at the Biological Department of the University, recently received for examination from the Director of the U. S. Geological Survey. The collection was made by Mr. W. H. Dall, near Archer, Florida, in a locality discovered by Dr. J. C. Neal, who had previously sent specimens to the Smithsonian Institution, and others directly to Prof. Leidy for identification. Some of these specimens had been brought to the notice of the Academy, as indicating a species of rhinoceros and of a horse, to the former of which the name of *R. proterus* was given, and to the latter that of *Hippotherium ingenum*. In the collection recently received are numerous bones and well-preserved teeth of the rhinoceros, mostly limb bones, among which are fourteen well-preserved astragali.

Some of the specimens exhibited are those of a mastodon, apparently a previously undescribed form, although upwards of